Notice of Allowability	Application No.	Applicant(s)
	09/450,364	CABRERA ET AL.
	Examiner	Art Unit
	Charles E Anya	2126

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☐ This communication is responsive to *Applicant's remarks/argument of 8/20/04*.

2. ☒ The allowed claim(s) is/are *1,6-8,11,19,21,31-33,35 and 36: now renumbered as 1-12*.

3. ☒ The drawings filed on *29 November 1999* are accepted by the Examiner.

4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a) ☐ All   b) ☐ Some*   c) ☐ None of the:

        1. ☐ Certified copies of the priority documents have been received.

        2. ☐ Certified copies of the priority documents have been received in Application No. _____ .

        3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

    * Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.

6. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.

    (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached

        1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.

    (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of

        Paper No./Mail Date _____.

    Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).

7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)

2. ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)

3. ☐ Information Disclosure Statements (PTO-1449 or PTO/SB/08), Paper No./Mail Date _____

4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material

5. ☐ Notice of Informal Patent Application (PTO-152)

6. ☒ Interview Summary (PTO-413), Paper No./Mail Date *1/5/05* .

7. ☒ Examiner's Amendment/Comment

8. ☐ Examiner's Statement of Reasons for Allowance

9. ☐ Other _____.

/MENG-AZ T. AN/
SUPERVISORY PATENT EXAM~~~
TECHNOLOGY CENTER 21

EXAMINER'S AMENDMENT

1.   An examiner's amendment to the record appears below. Should the changes

and/or additions be unacceptable to applicant, an amendment may be filed as provided

by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be

submitted no later than the payment of the issue fee.

2.   Authorization for this examiner's amendment was given in a telephone interview

with George C. Lewis (Reg. No. 53,214) on 1/5/05.

In the claims:

        a.   Claim 1;

        Rewrite claim 1 as follows:

Claim 1.   A storage management system on a computer comprising:

            a volume provider to map a logical storage volume onto one or more

storage devices of a storage subsystem, wherein the volume provider presents an

application programming interface (API), the API conforming to Component Object

Model (COM) interface, to applications on the computer;

            the API for receiving first desired behavioral attributes of the logical

storage volume;

            the volume provider reconfigures the logical storage volume of the one or

more storage devices by monitoring and comparing access patterns of the logical

storage volume using the first attributes received from a first application and second

desired behavioral attributes previously received via the API from a second application,

wherein the volume provider reconfigures the logical storage volume if the access

patterns differs from the first or second desired behavioral attributes; and

      wherein the first and second attributes are selected from a set of

predefined attributes including fault tolerance attribute, a fast crash recovery required

attribute, a removable attribute, an optimize for sequential reads attribute, an optimize

for sequential writes attributes, an optimize for mostly reads attribute, a reconfiguration

allowed attribute, an expected maximum size attribute, an optimal read size attribute, an

optimal read alignment attribute, optimal write attribute, an optimal write alignment

attribute, a maximum number spindles attribute, an interleave size attribute, and a

rebuild priority attribute.

      b.   Cancel claims 2-5 and 9-10;

      c.   Claim 11;

Rewrite claim 11 as follows:

Claim 11.   A method for managing one or more storage volumes of a storage

subsystem by a computer comprising:

      receiving, via application programming interface (API), the API conforming

to Component Object Model (COM) interface, presented by a volume provider to

applications on the computer, first storage access information from a first application;

previously received, from a second application via the API, second

storage access information;

reconfiguring, by the volume provider, one or more logical storage

volumes of the storage subsystem as a function of the first and second storage access

information, by monitoring and comparing access patterns of the logical storage volume,

wherein the reconfiguring by the volume provider occurs if the access patterns differs

from the first or second storage access information; and

wherein the first and second storage access information are selected from

a set of predefined attributes including fault tolerance attribute, a fast crash recovery

required attribute, a removable attribute, an optimize for sequential reads attribute, an

optimize for sequential writes attributes, an optimize for mostly reads attribute, a

reconfiguration allowed attribute, an expected maximum size attribute, an optimal read

size attribute, an optimal read alignment attribute, optimal write attribute, an optimal

write alignment attribute, a maximum number spindles attribute, an interleave, and a

rebuild priority attribute.

d.   Cancel claims 12-18 and 20;

e.   Claim 21;

Rewrite claim 21 as follows:

Claim 21.   A computer-readable medium having computer-executable instructions to

cause a computer to perform a method of:

receiving, from a first application via an application programming interface (API), the API conforming to Component Object Model (COM) interface, presented by volume provider to applications on the computer, first storage access information that characterizes desired volume behavioral attributes of one or more storage volumes when stored on a storage subsystem;

receiving, from a second application via the API, second storage access information that characterizes desired volume behavioral attributes of one or more storage volumes;

reconfiguring, by the volume provider, the one or more storage volumes of the storage subsystem based on the first and second access information by monitoring and comparing access patterns of the one or more storage volume, wherein the reconfiguring by the volume provider occurs if the access patterns differs from the first or second storage access information; and

wherein the first and second storage access information are selected from a set of predefined attributes including fault tolerance attribute, a fast crash recovery required attribute, a removable attribute, an optimize for sequential reads attribute, an optimize for sequential writes attributes, an optimize for mostly reads attribute, a reconfiguration allowed attribute, an expected maximum size attribute, an optimal read size attribute, an optimal read alignment attribute, optimal write attribute, an optimal write alignment attribute, a maximum number spindles attribute, an interleave, and a rebuild priority attribute.

    f.   Cancel claims 22 – 30;

    g.   Claim 31;

Rewrite claim 31 as follows:

Claim 31.   The method for configuring a logical volume onto a storage device comprising:

    receiving, by an application programming interface (API), the API conforming to Component Object Model (COM) interface, exposed by a volume provider to applications on a computer, first desired behavioral attributes for the logical volume form a first application, the first behavioral attributes independent of the storage device physical characteristics;

    receiving, by the API, second desired behavioral attributes for the logical volume from a second application on the computer;

    the volume provider reconfigures the logical storage volume of the storage devices by monitoring and comparing access patterns of the logical storage volume using the first desired behavioral attributes received from a first application and second desired behavioral attributes previously received via the API from a second application, wherein the volume provider reconfigures the logical storage volume if the access patterns differs from the first or second desired behavioral attributes; and

    wherein the first and second desired behavioral attributes are selected from a set of predefined attributes including fault tolerance attribute, a fast crash recovery required attribute, a removable attribute, an optimize for sequential reads

attribute, an optimize for sequential writes attributes, an optimize for mostly reads attribute, a reconfiguration allowed attribute, an expected maximum size attribute, an optimal read size attribute, an optimal read alignment attribute, optimal write attribute, an optimal write alignment attribute, a maximum number spindles attribute, an interleave size attribute, and a rebuild priority attribute.

     h.   Cancel claim 34;

     i.   Claim 36;

        -   line 2, insert after "application," – the --;

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Charles E Anya whose telephone number is (571) 272-3757. The examiner can normally be reached on M-F (8:30-6:00) First Friday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, An Meng-Ai can be reached on (571) 272-3756. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the

Patent Application Information Retrieval (PAIR) system. Status information for

published applications may be obtained from either Private PAIR or Public PAIR.

Status information for unpublished applications is available through Private PAIR only.

For more information about the PAIR system, see http://pair-direct.uspto.gov. Should

you have questions on access to the Private PAIR system, contact the Electronic

Business Center (EBC) at 866-217-9197 (toll-free).

Charles E Anya
Examiner
Art Unit 2126

cea.

SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2100